

# WOLF CREEK

NUCLEAR OPERATING CORPORATION

Donna Jacobs  
Vice President Operations and Plant Manager

**APR 09 2004**

WO 04-0017

U. S. Nuclear Regulatory Commission  
ATTN: Document Control Desk  
Washington, DC 20555

**Subject: Docket No. 50-482: Licensee Event Report 2004-002-00, Reactor Protection System Actuation and Reactor Trip due to Main Feedwater Regulating Valve Failing Closed**

Gentlemen:

The enclosed Licensee Event Report (LER) 2004-002-00 is being submitted pursuant to 10 CFR 50.73(a)(2)(iv)(A) regarding an Engineered Safety Features Actuation and Reactor Trip at Wolf Creek Generating Station.

Wolf Creek Nuclear Operating Corporation has made no commitments in the enclosed LER.

If you should have any questions regarding this submittal, please contact me at (620) 364-4246 or Mr. Kevin Moles at (620) 364-4126.

Sincerely,



Donna Jacobs

DJ/rlg

Enclosure

cc: J. N. Donohew (NRC), w/e  
D. N. Graves (NRC), w/e  
B. S. Mallett (NRC), w/e  
Senior Resident Inspector (NRC), w/e

IE22

<b>NRC FORM 366</b> (7-2001)		<b>U.S. NUCLEAR REGULATORY COMMISSION</b>		<b>APPROVED BY OMB NO. 3150-0104</b> <small>Estimated burden per response to comply with this mandatory information collection request 50 hours. Reported lessons learned are incorporated into the licensing process and fed back to industry. Send comments regarding burden estimate to the Records Management Branch (T-6 E6), U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001, or by internet e-mail to: bjs1@nrc.gov, and to the Desk Officer, Office of Information and Regulatory Affairs, NE08-10202 (3150-0104), Office of Management and Budget, Washington, DC 20503. If a means used to impose information collection does not display a currently valid OMB control number, the NRC may not conduct or sponsor, and a person is not required to respond to, the information collection.</small>		<b>EXPIRES 7-31-2004</b>					
<b>LICENSEE EVENT REPORT (LER)</b> <small>(See reverse for required number of digits/characters for each block)</small>											
<b>1. FACILITY NAME</b> WOLF CREEK GENERATING STATION				<b>2. DOCKET NUMBER</b> 05000 482		<b>3. PAGE</b> 1 OF 3					
<b>4. TITLE</b> Reactor Protection System Actuation and Reactor Trip due to Main Feedwater Regulating Valve Failing Closed											
<b>5. EVENT DATE</b>			<b>6. LER NUMBER</b>			<b>7. REPORT DATE</b>					
MO	DAY	YEAR	YEAR	SEQUENTIAL NUMBER	REV NO	MO	DAY	YEAR			
02	13	2004	2004	002	00	04	09	2004			
<b>8. OTHER FACILITIES INVOLVED</b>											
			FACILITY NAME DOCKET NUMBER 05000								
			FACILITY NAME DOCKET NUMBER 05000								
<b>9. OPERATING MODE</b> 1			<b>11. THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check all that apply)</b>								
<b>10. POWER LEVEL</b> 100			20.2201(b)		20.2203(a)(3)(ii)		50.73(a)(2)(ii)(B)		50.73(a)(2)(ix)(A)		
			20.2201(d)		20.2203(a)(4)		50.73(a)(2)(iii)		50.73(a)(2)(x)		
			20.2203(a)(1)		50.36(c)(1)(i)(A)		✓ 50.73(a)(2)(iv)(A)		73.71(a)(4)		
			20.2203(a)(2)(i)		50.36(c)(1)(ii)(A)		50.73(a)(2)(v)(A)		73.71(a)(5)		
			20.2203(a)(2)(ii)		50.36(c)(2)		50.73(a)(2)(v)(B)		OTHER Specify in Abstract below or in NRC Form 366A		
			20.2203(a)(2)(iii)		50.46(a)(3)(ii)		50.73(a)(2)(v)(C)				
			20.2203(a)(2)(iv)		50.73(a)(2)(i)(A)		50.73(a)(2)(v)(D)				
			20.2203(a)(2)(v)		50.73(a)(2)(i)(B)		50.73(a)(2)(vii)				
			20.2203(a)(2)(vi)		50.73(a)(2)(i)(C)		50.73(a)(2)(viii)(A)				
			20.2203(a)(3)(i)		50.73(a)(2)(ii)(A)		50.73(a)(2)(viii)(B)				
<b>12. LICENSEE CONTACT FOR THIS LER</b>											
<b>NAME</b> Kevin J. Moles, Manager Regulatory Affairs						<b>TELEPHONE NUMBER (Include Area Code)</b> (620) 364-4126					
<b>13. COMPLETE ONE LINE FOR EACH COMPONENT FAILURE DESCRIBED IN THIS REPORT</b>											
CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO EPIX	CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO EPIX		
A	SJ	FCV	C635	Yes							
<b>14. SUPPLEMENTAL REPORT EXPECTED</b>											
YES (If yes, complete EXPECTED SUBMISSION DATE)					✓ NO		<b>15. EXPECTED SUBMISSION DATE</b>		MONTH	DAY	YEAR
<b>16. ABSTRACT</b> (Limit to 1400 spaces, i.e., approximately 15 single-spaced typewritten lines)											
<p>On February 13, 2004, at 8:04 AM CST, Wolf Creek Generating Station (WCGS) experienced an automatic actuation of the Reactor Protection System (RPS) including an automatic reactor trip due to Lo-Lo water level in the "D" steam generator (SG). This actuation occurred following failure of the "D" SG main feedwater regulating valve (MFRV) resulting in valve closure. When the MFRV failed closed, "D" SG level decreased below the reactor trip setpoint, initiating a reactor trip. The unit received an expected feedwater isolation and auxiliary feedwater actuation (both motor and turbine driven pumps) because of the Lo-Lo SG level. All control rods fully inserted, and the RPS and Engineered Safety Features (ESF) systems performed as expected.</p> <p>The cause of the MFRV closure was separation of the valve plug from the valve stem, which caused the plug to fall into its seated (closed) position. The stem/plug assemblies were subsequently replaced in all four (4) MFRVs.</p> <p>The safety significance of this event is low. This event is bounded by the current licensing basis analyses as reported in WCGS Updated Safety Analysis Report (USAR) section 15.2.7 "Loss of Normal Feedwater Flow." All safety related equipment performed as expected. There were no adverse effects on the health and safety of the public.</p>											

## LICENSEE EVENT REPORT (LER)

1. FACILITY NAME	2. DOCKET	6. LER NUMBER			3. PAGE
WOLF CREEK GENERATING STATION	05000 482	YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	2 OF 3
		2004	002	00	

## 17. NARRATIVE (If more space is required, use additional copies of NRC Form 366A)

## Background:

Steam Generator (SG) [EIS Code: SG] level is normally controlled by automatic adjustments in the Main Feedwater System [EIS Code: SJ] main feedwater regulating valve (MFRV) [EIS Code: FCV] position and main feedwater pump [EIS Code: P] speed. The MFRV stem/plug assembly has a taper junction connection where the valve stem connects with the plug. This junction consists of a hole in the top of the plug that the valve stem fits into. The top half of this hole is tapered and the bottom of the hole has threads that the stem is screwed into. When the valve stem is screwed (and torqued) into the hole the tapered area creates a tight interference fit between the stem and plug. The stem/plug assembly is then pinned with a solid pin to prevent the plug from rotating and unscrewing from the stem. If the stem/plug joint is loose, more of the load will be borne by the pin than intended by design.

## Plant Conditions Prior to the Event:

MODE – 1

Power – 100 percent

Normal Operating Temperature and Pressure

## Event Description:

On February 13, 2004, Wolf Creek Generating Station (WCGS) was operating at 100 percent steady state power. At 8:04 AM CST the valve plug in the "D" MFRV separated from the valve stem and failed to the closed position, isolating the Main Feedwater supply to SG "D". This caused a rapid lowering of water level in SG "D" that initiated a reactor trip on Lo-Lo SG level.

At the time of the trip, all control rods fully inserted and all safety equipment performed as designed. Main feedwater was isolated and motor-driven and turbine-driven auxiliary feedwater pumps started as expected. There were no significant maintenance or operating evolutions in progress at the time of the trip, nor were there any major pieces of equipment out of service.

## Basis for Reportability:

The reactor trip and subsequent actuation of Engineered Safety Features (ESF) described in this event is reportable per 10 CFR 50.73(a)(2)(iv)(A), which requires reporting of "Any event or condition that resulted in manual or automatic actuation of any of the systems listed in paragraph (a)(2)(iv)(B) of this section." Paragraph (B)(1) of 10 CFR 50.73(a)(2)(iv) includes "Reactor protection system (RPS) including: reactor scram or reactor trip."

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		2004	- 002	- 00	

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## Root Cause:

The cause for the reactor trip was separation of the MFRV plug from the stem, which caused the valve to fail in the closed position and isolate main feedwater to SG "D".

The root cause for the separation of the plug from the stem was insufficient problem assessment and resolution to resolve loose stem conditions identified in the "A", "B" and "D" MFRVs in October 2003 during WCNOG's Refueling Outage 13. At that time WCGS engineering staff incorrectly reasoned that installation of new solid pins would provide a sufficient margin of strength to allow the continued use of the loose stem/plug assemblies. This decision was not documented and reviewed as required by plant procedures.

## Corrective Actions:

To address the hardware issues, the stem/plug assemblies for all 4 MFRVs were replaced with new stem/plug assemblies with tight stem to plug connections.

Actions to address the failure to adequately assess and resolve the loose stem-to-plug fit condition previously identified are being developed within the WCNOG corrective action program.

## Safety Significance:

The safety significance of this event is low. This event is bounded by the current licensing basis analysis as reported in WCGS Updated Safety Analysis Report (USAR) section 15.2.7 "Loss of Normal Feedwater Flow." The event reduced normal feedwater flow to the "D" SG, resulting in the reduction of level in the secondary side of the SG. The reduction in SG level provided the input (Lo-Lo SG Level Signal) to trip the reactor, isolate all normal feedwater, and start the motor and turbine driven auxiliary feedwater pumps. There were no adverse effects on the reactor core, the reactor coolant system, or the main steam system, due to the auxiliary feedwater system's capacity to supply the necessary heat sink.

All safety related equipment performed as designed and there were no adverse effects on the health and safety of the public.

## Operating Experience/Previous Events:

In June, 1996, WCGS experienced a reactor trip because of a stem/plug assembly separation in MFRV "C" caused by failure of a roll pin due to spare stem/plug assemblies installed in March 1996 (Refuel 8) not being upgraded from roll pins to solid pins during a 1988 pin upgrade.